



GOVERNMENT OF
NEWFOUNDLAND
AND LABRADOR



Significant Discoveries Offshore Newfoundland and Labrador

Updated 1988-03



Department of Energy
Government of Newfoundland and Labrador

FOREWORD

This report has been prepared by the Department of Energy to provide information regarding oil and gas discoveries offshore Newfoundland and Labrador. It provides a brief discussion of the geology and commercial potential of each discovery, a table of drillstem test results, a generalized geologic cross-section and a fact sheet pertaining to the discovery well. Flow rates for liquids (including oil, condensate and formation water) are given in barrels per day while natural gas rates are quoted in millions of cubic feet per day.

"Significant Discoveries Offshore Newfoundland and Labrador" is issued under the authority of R. Gordon Gosse, Deputy Minister of Energy and the Honourable A. Brian Peckford, Premier and Minister of Energy.



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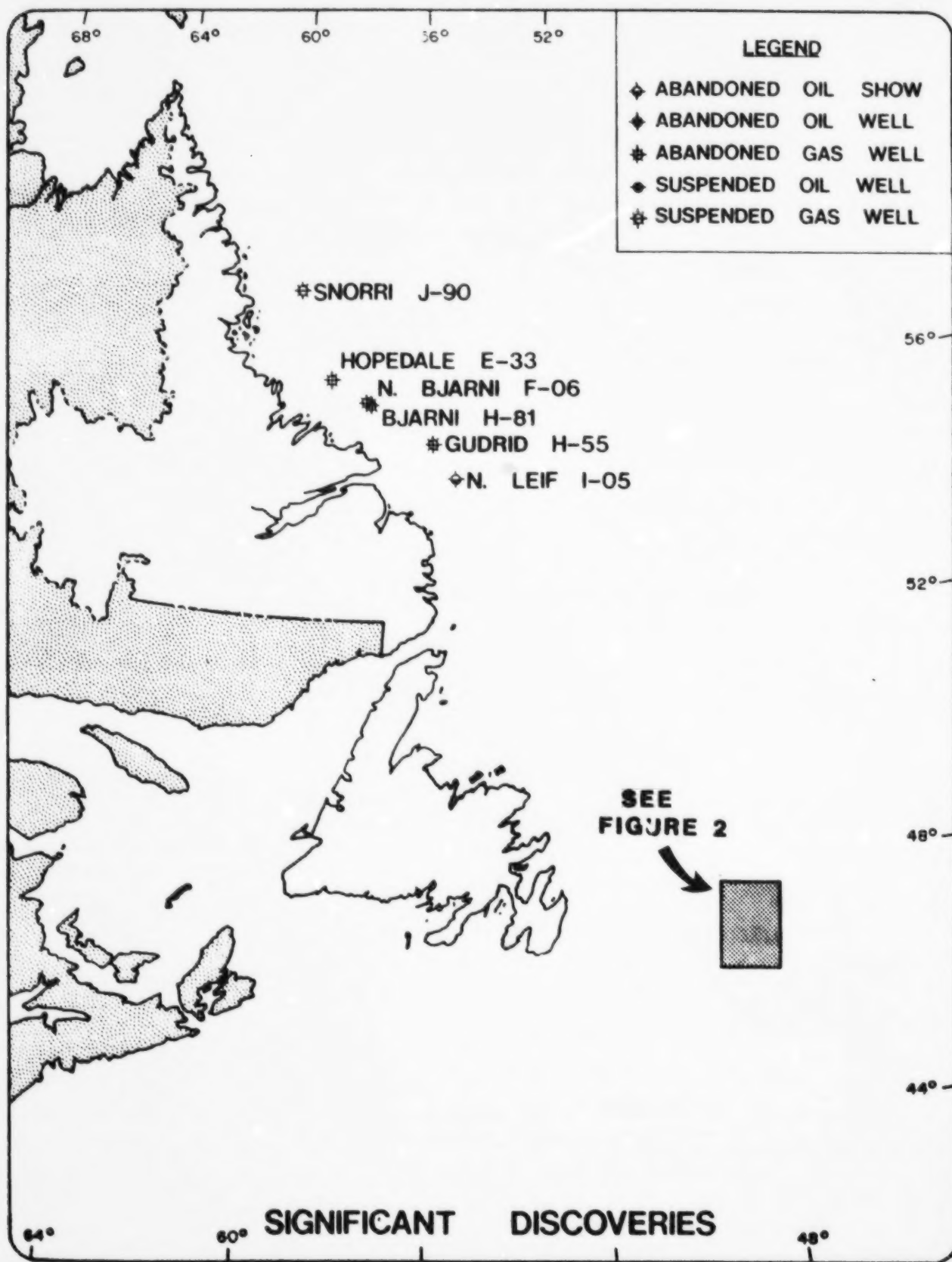


FIGURE 1

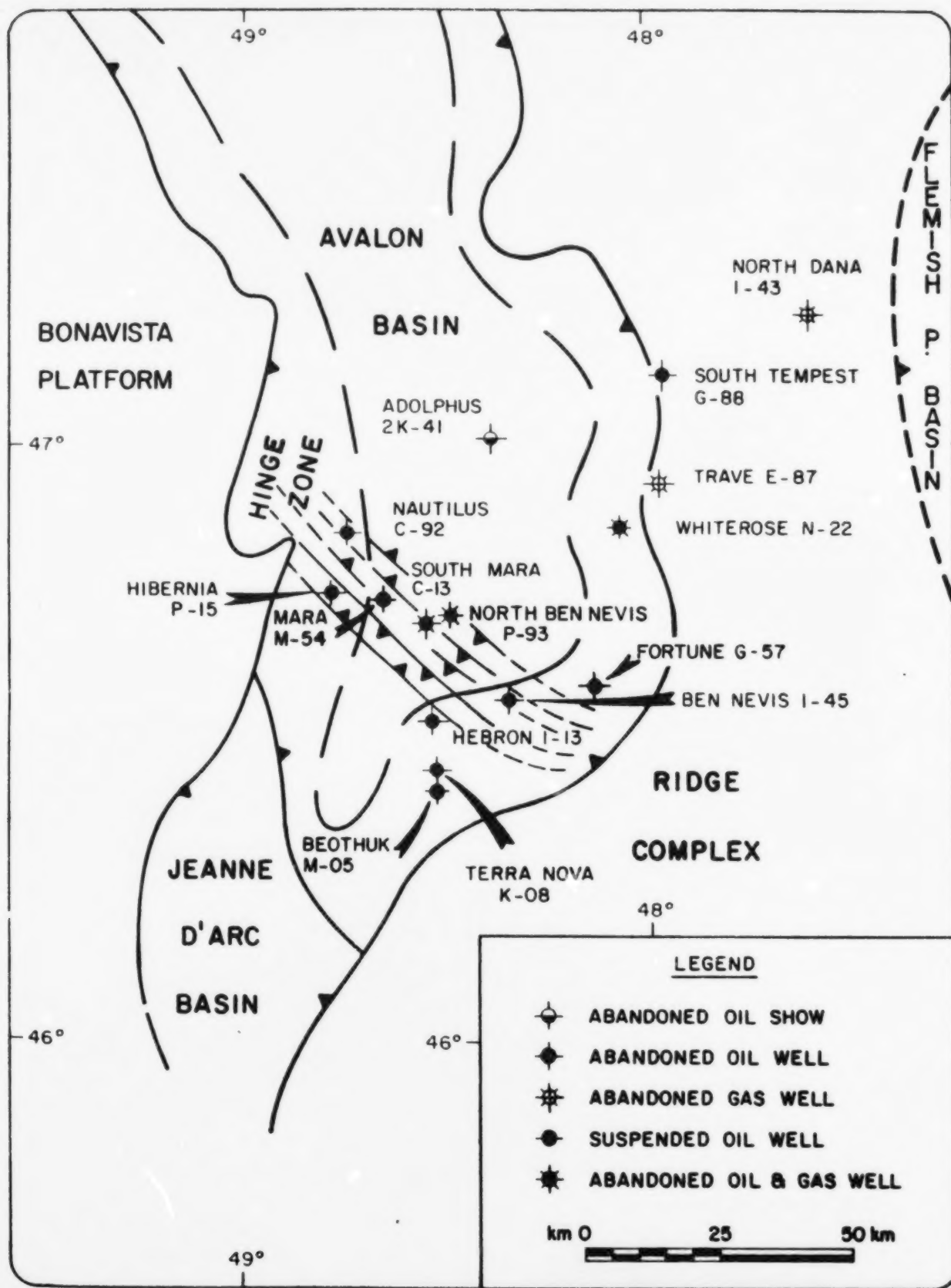


FIGURE 2

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STRUCTURE NAME: ADOLPHUS

DISCOVERY WELL: Mobil-Gulf Adolphus 2K-41

LOCATION: $47^{\circ} 00' 41''$ N; $48^{\circ} 22' 06''$ W

STATUS: Abandoned

FINAL TOTAL DEPTH: 3658m

WATER DEPTH: 114m

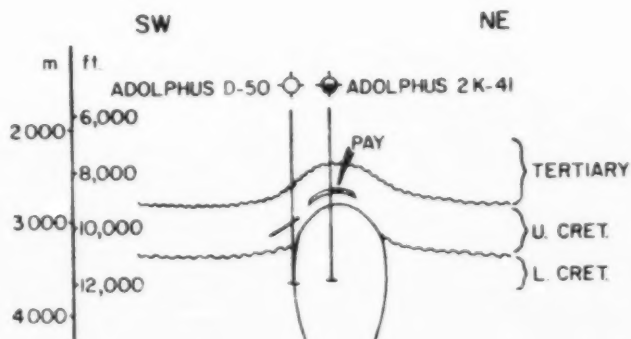
DRILLING UNIT: Sedco J

SPUD DATE: December 10, 1972

RIG RELEASE DATE: September 26, 1973

STEPOUT WELLS: Mobil-Gulf Adolphus D-50

SCHEMATIC CROSS-SECTION



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Geological Discussion

Adolphus 2K-41 was the first well on the Atlantic continental margin to test free oil to surface. The structure in plan view is represented by a salt generated domal closure in Upper Cretaceous sediments. A thin 1.8 m, very fine grained calcareous sandstone in the Upper Cretaceous Dawson Canyon Formation forms the oil-bearing reservoir. The D-50 stepout well drilled on the flank of the dome failed to encounter the oil-bearing sandstone. This discovery has no potential for commercial production.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2609-2647.2	Misrun			
2	2609-2647.2	Misrun			
3	2609-2647.2 (Dawson Canyon)	40/64	268	0.2	Trace
4	2499.4-2508.5 (Dawson Canyon)	Misrun			
5	2499.4-2508.5 (Dawson Canyon)	40/64	No Flow to Surface		3060 feet of water in drill pipe
6	2377.4-2438.4 (Banquereau)	40/64	No Flow to Surface		6600 feet of water in drill pipe
7	1935.5-1981.2 (Banquereau)	40/64	No Flow to Surface		Partial Misrun
8	1173.5-1219.2 (Banquereau)	40/64	No Flow to Surface		7 bbl drilling mud



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STRUCTURE NAME: BEN NEVIS

DISCOVERY WELL: Mobil et al Ben Nevis I-45

LOCATION: $46^{\circ} 34' 40''$ N; $48^{\circ} 21' 10''$ W

STATUS: Suspended Oil Well

FINAL TOTAL DEPTH: 4933m

WATER DEPTH: 98m

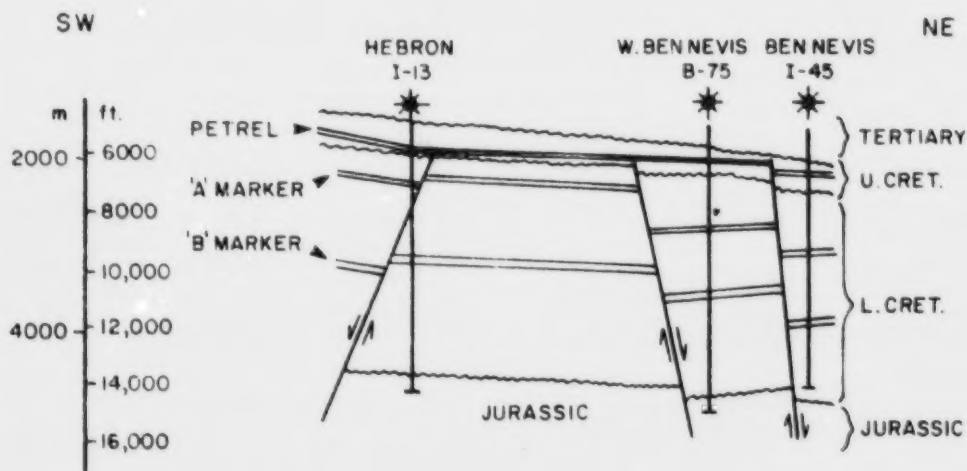
DRILLING UNIT: Zapata Uglund

SPUD DATE: January 10, 1980

RIG RELEASE DATE: September 10, 1980

STEPOUT WELLS: Petro-Canada et al West Ben Nevis B-75

SCHEMATIC CROSS-SECTION



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Geological Discussion

The Ben Nevis structure is located in a hinge zone along the southeastern margin of the Avalon basin. Hydrocarbon bearing Lower Cretaceous Avalon and Hibernia sandstone reservoirs similar to those at Hibernia were encountered in the Ben Nevis I-45 well. The stepout well, West Ben Nevis B-75, is located between Ben Nevis and the Hebron I-13 discovery of 1981.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	4535-4550 (Hibernia)	32/64	1596	12.0	0
2	4462-4477 (Hibernia)	No Flow to Surface			
3	4426-4438 (Hibernia)	Misrun			
4	4333.5-4340 (Hibernia)	Misrun			
5	4333.5-4340 (Hibernia)	32/64	0	0	168
6	4320.5-4327.5 Hibernia	32/64	0	0	30
7	4185-4197 (Hibernia)	32/64	0	0	228
8	4112-4119 (Hibernia)	32/64	0	0	507
9	2883-2894 (Avalon)	32/64	261	10.3	430
10	2440.5-2445.5 (Avalon)	32/64	182	TSTM	0
11	2420-2432 (Avalon)	40/64	218	0	132
12	2398-2401 (Avalon)	32/64	0	0	123
13	2378-2383 (Avalon)	32/64	66	0	53



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STRUCTURE NAME: WEST BEN NEVIS

STEPOUT WELL: Petro-Canada et al West Ben Nevis B-75

LOCATION: $46^{\circ} 34' 01''$ N; $48^{\circ} 26' 03''$ W

STATUS: Abandoned Oil Well

FINAL TOTAL DEPTH: 4987m

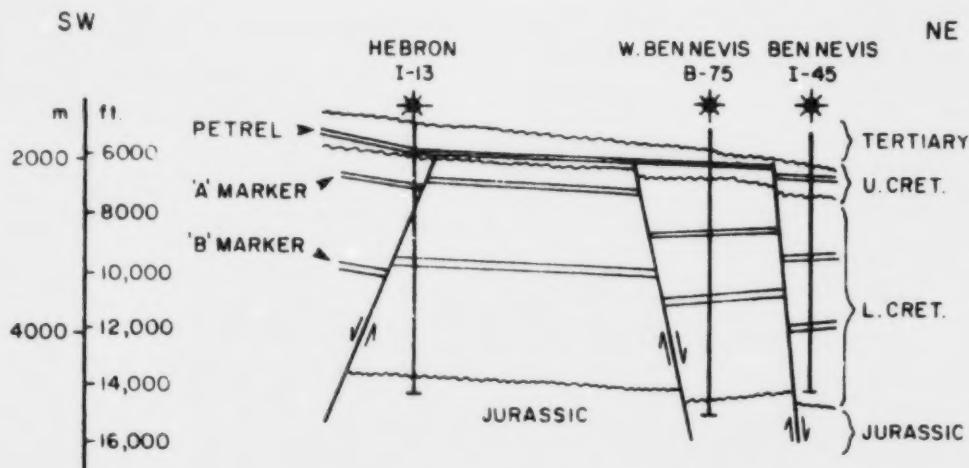
WATER DEPTH: 98m

DRILLING UNIT: Bow Drill 1/Sedco 710

SPUD DATE: July 15, 1984

RIG RELEASE DATE: July 18, 1985

SCHEMATIC CROSS-SECTION



Geological Discussion

The West Ben Nevis B-75 stepout well flowed a large volume of oil from a Jurassic zone, not penetrated in the discovery well, Ben Nevis I-45. The Avalon section in B-75 flowed better than the equivalent zones in I-45, but the major zone with the best flow in I-45 (Hibernia zone) does not contain appreciable hydrocarbons in the B-75 well.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1-4	Misruns				
5	4498-4507 (Jurassic)	32/64	5967	5.1	0
6	2445-2465 (Avalon)	40/64	2120	0.7	0
7	2044-2065 (Avalon)	No flow to surface. Recovered approx. 50 bbls. of formation water with traces of oil.			
8	2002-2015 (Avalon)	20/64	600	0.2	0



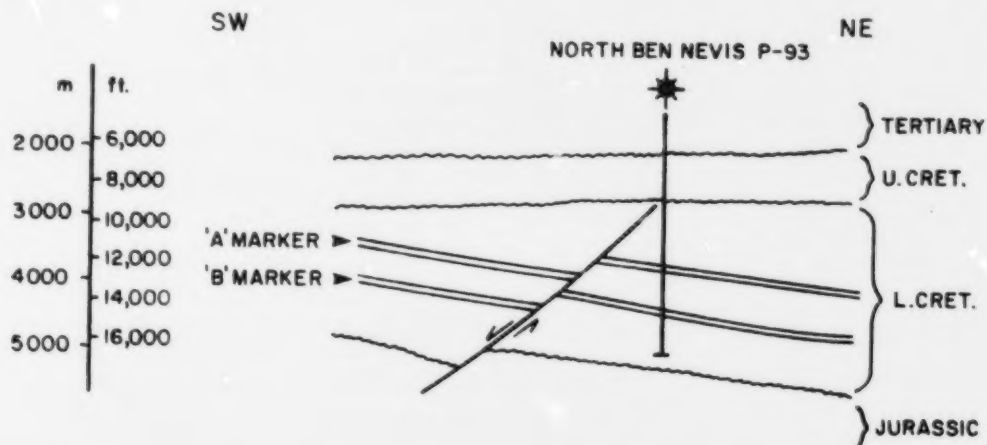
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STRUCTURE NAME:	NORTH BEN NEVIS
DISCOVERY WELL:	Husky-Bow Valley et al North Ben Nevis P-93
LOCATION:	46° 42' 49" N; 48° 28' 34" W
STATUS:	Abandoned Oil and Gas Well
FINAL TOTAL DEPTH:	5197m
WATER DEPTH:	99m
DRILLING UNIT:	Bow Drill 3
SPUD DATE:	December 18, 1984
RIG RELEASE DATE:	November 1, 1985
STEPOUT WELLS:	Husky-Bow Valley et al North Ben Nevis M-61

SCHEMATIC CROSS-SECTION



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Geological Discussion

The North Ben Nevis structure is located on the northeast margin of a NW-SE trending fault complex that effects much of the southwestern Avalon Basin. The discovery well is located approximately 5 km northeast of South Mara C-13 and encountered a reservoir of similar age and characteristics. The apparent structural and stratigraphic simplicity and the excellent flow capacity of the reservoir, may make this field a good candidate for commercial production. The operator estimates a range of recoverable reserves of 50 to 150 million barrels.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
2	3091-3095 (Avalon)	30/64	2824	.933	0
3	3080-3085 (Avalon)	30/64	2110	.377	0
4	3061-3067 (Avalon)	40/64	576*	16.850	0

* Condensate



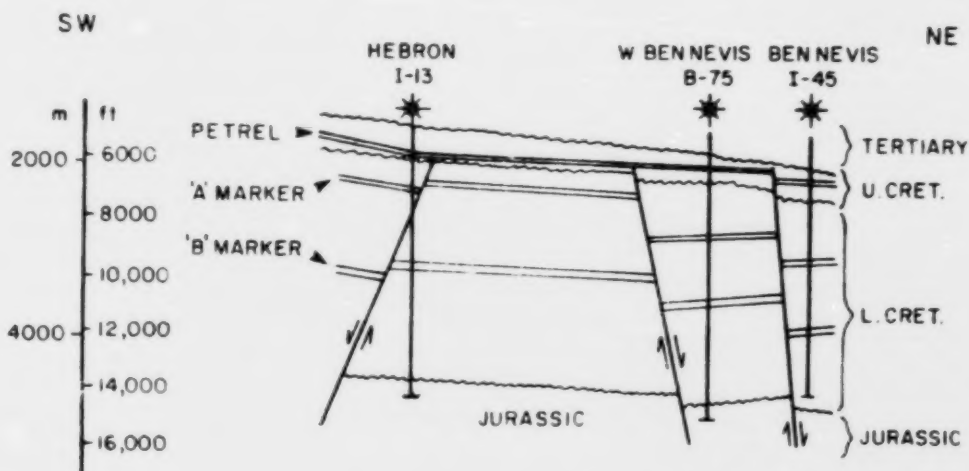
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STRUCTURE NAME:	HEBRON
DISCOVERY WELL:	Mobil et al Hebron I-13
LOCATION:	46° 32' 34" N; 48° 31' 45" W
STATUS:	Suspended Oil Well
FINAL TOTAL DEPTH:	4723m
WATER DEPTH:	94m
DRILLING UNIT:	Sedco 706
SPUD DATE:	January 15, 1981
RIG RELEASE DATE:	September 13, 1981
STEPOUT WELLS:	Petro-Canada et al North Trinity H-71

SCHEMATIC CROSS-SECTION



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Geological Discussion

The Hebron Structure is located in the southeastern hinge zone of the Avalon Basin. Hydrocarbon bearing sandstone reservoirs were encountered in the Lower Cretaceous Avalon and "B" Marker zones and in the Jurassic. Resource estimates for this structure are below those required for commercial development. This structure is 12.1 km from the Ben Nevis oil discovery and 7 km from the West Ben Nevis stepout well. These structures combined may contain enough recoverable oil for commercial development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	4368-4381 (Jurassic)	32/64	2322	3.2	0
2	4350-4356 (Jurassic)	No Flow to Surface, No Recovery			
3	4196-4205 (Jurassic)	No Flow to Surface, No Recovery			
4	4050-4064 (Jurassic)	No Flow to Surface, No Recovery			
5	3842-3845 3853-3857 (Jurassic)	32/64	3066	1.7	0
6	2975-2986 (B Marker)	32/64	Oily Water to Surface, Reversed Out 73 bbl oil.		
7	2923-2940 (B Marker)	32/64	2227	1.1	0
8	2722-2735 (B Marker)	32/64	Reversed Circulated 21 bbl brine and 10 bbl heavy, black gassified oil.		
9	1905.3-1915.5 (Avalon)	32/64	693	0.1	21
10	1866-1876 (Avalon)	32/64	762	0.2	12



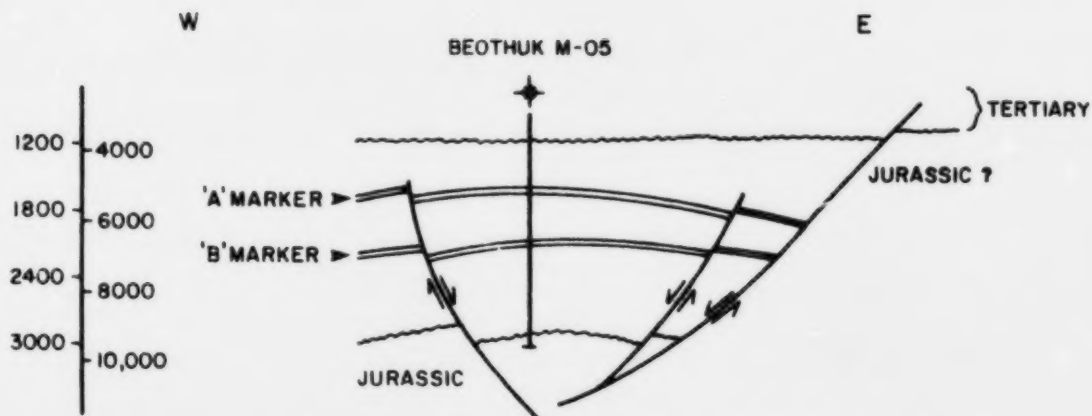
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STRUCTURE NAME:	BEOTHUK
DISCOVERY WELL:	Canterra et al Beothuk M-05
LOCATION:	$46^{\circ} 24' 49''$ N; $48^{\circ} 31' 14''$ W
STATUS:	Abandoned Oil Well
FINAL TOTAL DEPTH:	3779m
WATER DEPTH:	93m
DRILLING UNIT:	SDS Vinland
SPUD DATE:	November 5, 1984
RIG RELEASE DATE:	January 25, 1985
STEPOUT WELLS:	None

SCHEMATIC CROSS-SECTION



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Geological Discussion

The Beothuk M-05 well is located on the southeast margin of the Avalon Basin approximately 2 km south of Terra Nova K-07. Pay zones were encountered in the Upper Jurassic Jeanne d'Arc sandstone. Resource estimates are below that required for commercial development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
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Four drillstem tests were conducted between 2,740 and 3,061 metres, three of which yielded oil. The largest flow recorded was 1432 BOPD, of 31⁰ API, on a 36/64 inch choke.



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STRUCTURE NAME: TERRA NOVA

DISCOVERY WELL: Petro Canada et al Terra Nova K-08

LOCATION: $46^{\circ} 27' 31''$ N; $48^{\circ} 31' 00''$ W

STATUS: Suspended Oil Well

FINAL TOTAL DEPTH: 4500m

WATER DEPTH: 94m

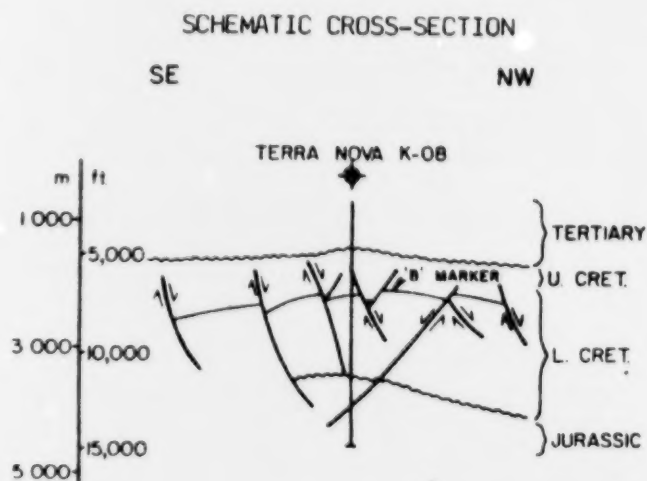
DRILLING UNIT: Sedco 710

SPUD DATE: August 2, 1983

RIG RELEASE DATE: June 11, 1984

STEPOUT WELLS: Petro-Canada et al Terra Nova K-18, K-17, K-07, I-97*, H-99, C-09, and E-79

* Officially classed as a wildcat well.



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Geological Discussion

The Terra Nova oilfield is located approximately 35 km southeast of Hibernia. The discovery well, Terra Nova K-08 encountered hydrocarbons within the upper Jurassic, Jeanne D'Arc Sandstone. Delineation drilling has demonstrated that the field has commercial potential. The operator for this field, Petro-Canada, estimates recoverable reserves of between 70 and 130 million barrels of oil and has announced plans to move ahead towards development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	3530-3544 (Jeanne D'Arc)	16/64	780	0.4	0
2	3410-3423 (Jeanne D'Arc)	64/64	5200	4.0	0
3	3380-3397 (Jeanne D'Arc)	40/64	3732	2.6	0
4	3329-3336 (Jeanne D'Arc)	40/64	1170	1.1	0



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STRUCTURE NAME: HIBERNIA

DISCOVERY WELL: Chevron et al Hibernia P-15

LOCATION: $46^{\circ} 44' 59''$ N; $48^{\circ} 46' 51''$ W

STATUS: Suspended Oil Well

FINAL TOTAL DEPTH: 4407m

WATER DEPTH: 80m

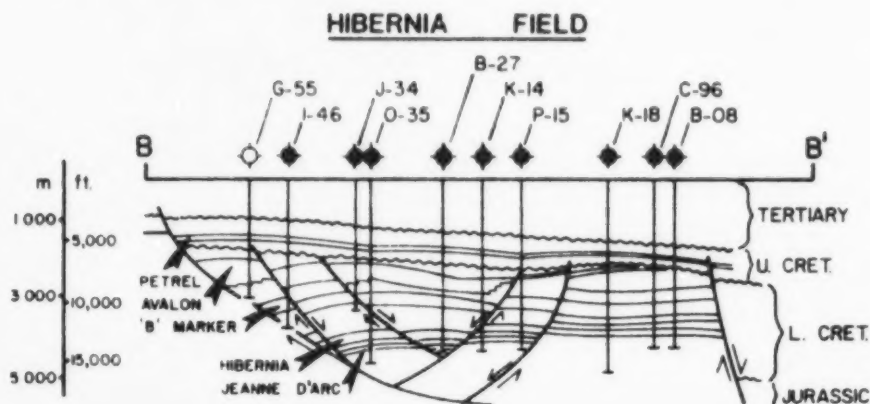
DRILLING UNIT: Glomar Atlantic/Zapata Uglund

SPUD DATE: May 27, 1979

RIG RELEASE DATE: January 7, 1980

STEPOUT WELLS: 9 drilled to date

SCHEMATIC CROSS-SECTION



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Geological Discussion

The Hibernia field contains hydrocarbons in the Lower Cretaceous Avalon, "B" Marker and Hibernia sandstones and in the Jurassic Jeanne D'Arc sandstone. Most of the recoverable oil is found in the Avalon and Hibernia zones. Current estimates place recoverable reserves at over 500 million barrels of oil, qualifying Hibernia as a giant field by world standards.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
2	4113.1-4129.2 (Jeanne D'Arc)	Misrun			
4	4113-4134 (Jeanne D'Arc)	16/64	800	0.2	0
5	3898-3905 (Jeanne D'Arc)	26/64	0	0	Re- covered Salt Water and Mud
6	3852-3858 (Hibernia)	26/64	2657	1.9	0
7	3841-3345 (Hibernia)	26/64	2160	1.8	0
8	3805-3822 (Hibernia)	40/64	3724	4.4	0
9	3742-3746 (Hibernia)	Misrun			
10	3742-3746 (Hibernia)	26/64	2021	2.1	0
11	2422-2443 (Avalon)	26/64	1166	0.4	0
12	1440-1460 (Upper Cretaceous)	26/64	0	0	Re- covered Water Cut Mud



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STRUCTURE NAME: NAUTILUS

DISCOVERY WELL: Mobil et al Nautilus C-92

LOCATION: $46^{\circ} 51' 04''$ N; $48^{\circ} 44' 21''$ W

STATUS: Suspended Oil Well

FINAL TOTAL DEPTH: 5117m

WATER DEPTH: 84m

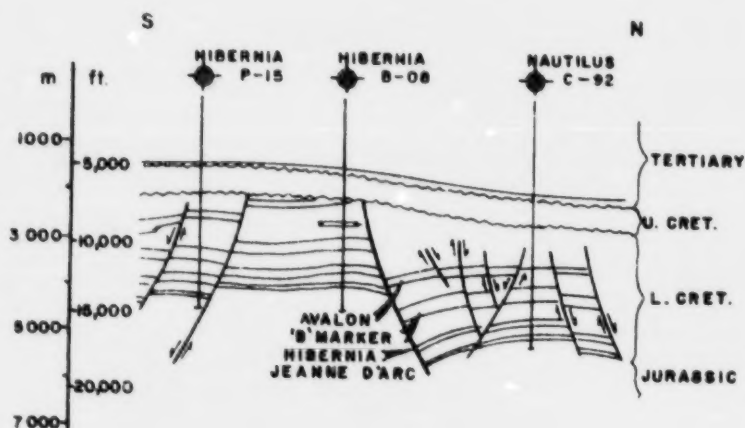
DRILLING UNIT: Sedco 706

SPUD DATE: September 29, 1981

RIG RELEASE DATE: July 18, 1982

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Geological Discussion

Nautilus C-92, located approximately 7 km north of Hibernia B-08, is separated from the Hibernia structure by a major listric normal fault with a throw of about 1290m. The stratigraphy at Nautilus is similar to that of the Hibernia field. Two sandstone units in the Lower Cretaceous main Avalon zone recovered oil, however, the Lower Cretaceous "B" Marker, Hibernia and Jeanne D'Arc sandstones were either mainly wet or tight at Nautilus. Resource potentials for Nautilus are too low for independent development, however, it's proximity to Hibernia may allow for a future joint development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	3982-4001 (B Marker)	32/64 24/64	Trace	5.3 1.5	1126 1919
2	3405-4310 3415-3418 (Avalon)	16/64 16/64	No Flow to Surface		
3	3325-3336 (Avalon)	32/64	2630	2.3	0
4	3285-3300 (Avalon)	32/64	2101	1.9	0
5	3261-3274 (Avalon)		No Flow to Surface		



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STRUCTURE NAME: MARA

DISCOVERY WELL: Mobil et al Mara M-54

LOCATION: $46^{\circ} 43' 49''$ N; $48^{\circ} 38' 44''$ W

STATUS: Abandoned Oil and Gas Well

FINAL TOTAL DEPTH: 4446m

WATER DEPTH: 88m

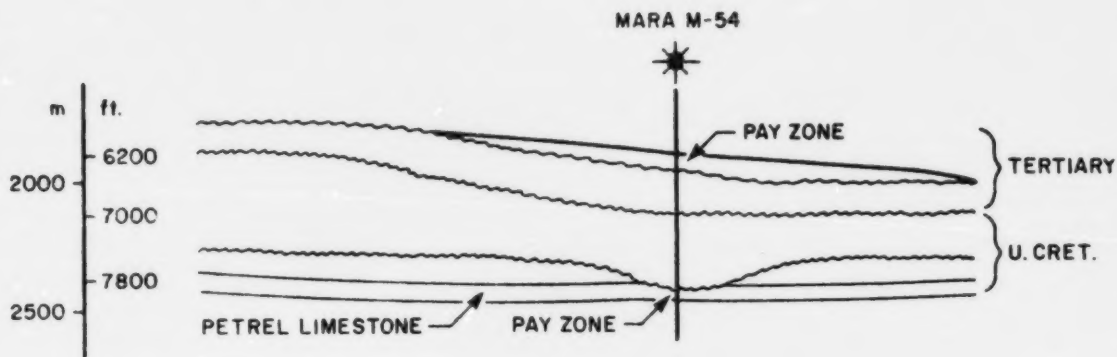
DRILLING UNIT: John Shaw

SPUD DATE: October 21, 1984

RIG RELEASE DATE: May 14, 1985

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Geological Discussion

The Mara M-54 well is located approximately 6 km southeast of Hibernia C-96. The Avalon and Hibernia sands did not prove to be productive but pay zones were encountered in the Upper Cretaceous and Tertiary. Resource estimates are below that required for commercial development but its proximity to Hibernia may allow for a future joint development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2704-2708	(Minor amounts of 11 ⁰ API oil and water)			
2	2403-2408 (U. Cretaceous)	32/64	770	.290	0
3	1851-1857 (Tertiary)	24/64	610	.130	0



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STRUCTURE NAME: SOUTH MARA

DISCOVERY WELL: Mobil et al South Mara C-13

LOCATION: $46^{\circ} 42' 01''$ N; $48^{\circ} 32' 20''$ W

STATUS: Suspended Oil Well

FINAL TOTAL DEPTH: 5034m

WATER DEPTH: 95m

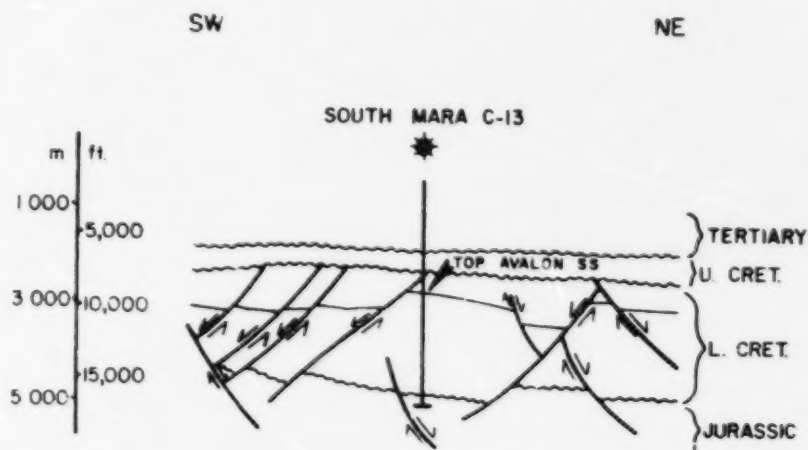
DRILLING UNIT: John Shaw

SPUD DATE: March 21, 1984

RIG RELEASE DATE: October 19, 1984

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



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Geological Discussion

The South Mara structure is located approximately 16 km southeast of Hibernia. Excellent reservoir characteristics were encountered in a Lower Cretaceous sandstone at 2920 m and this zone subsequently has tested significant volumes of oil and gas/condensate. Further delineation drilling is required to access the commercial viability of this discovery.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2952-2958 (L. Cretaceous)	24/64	1734	2.1	0
2	2926-2932 (L. Cretaceous)	32/64	663*	14.1	0
3	1863-1865 (Tertiary)	No Flow to Surface.			

* Condensate



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STRUCTURE NAME: WHITEROSE

DISCOVERY WELL: Husky/Bow Valley et al Whiterose N-22

LOCATION: $46^{\circ} 51' 48''$ N; $48^{\circ} 03' 57''$ W

STATUS: Abandoned Oil and Gas Well

FINAL TOTAL DEPTH: 4628m

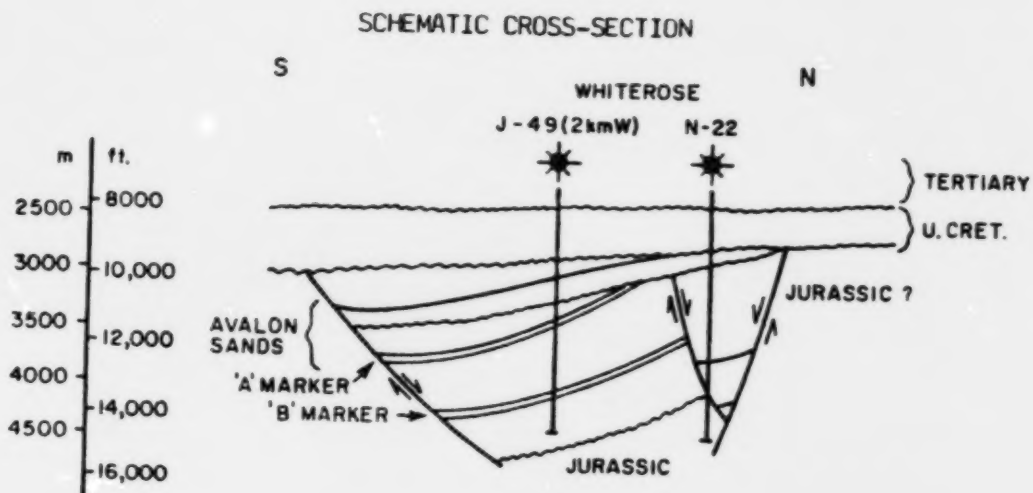
WATER DEPTH: 122m

DRILLING UNIT: Sedco 706

SPUD DATE: June 27, 1984

RIG RELEASE DATE: January 5, 1985

STEPOUT WELLS: Husky-Bow Valley et al Whiterose J-49,
L-61 and E-09



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Geological Discussion

The Whiterose structure is a large domal feature, located on the eastern margin of the Avalon Basin. The discovery well is located on the eastern flank of the dome and encountered pay in both the Avalon and Hibernia zones. The attached schematic is deceptively simple as the structure is, in fact, cut by many faults that appear to radiate from the centre of the dome. Several delineation wells will be required to determine the economic feasibility of this field.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	3565-3572 (Hibernia)	12/64	361	0.3	0
2	3542-3554 (Hibernia)	20/64	550	0.4	0
3	2725-2727 (Lower Avalon)	16/64	0	1.4	0
4	2689-2695 (Avalon)	20/64	163*	3.6	0
5	2668-2685 (Avalon)	64/64	675*	21.4	0
6	2380-2389 (Wyandot Chalk)	AOF**	0	0.03	0

* Condensate

**AOF - absolute open flow



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STRUCTURE NAME: TRAVE

DISCOVERY WELL: Husky Bow Valley et al Trave E-87

LOCATION: $46^{\circ} 56' 18''$ N; $47^{\circ} 58' 10''$ W

STATUS: Abandoned Gas Well

FINAL TOTAL DEPTH: 3987m

WATER DEPTH: 138m

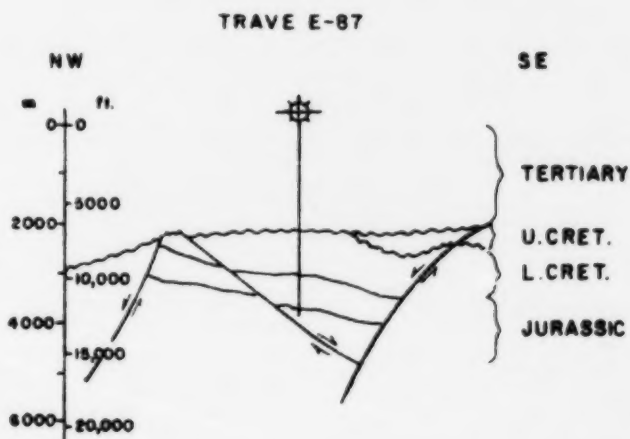
DRILLING UNIT: John Shaw/Sedco 706

SPUD DATE: November 12, 1983

RIG RELEASE DATE: June 26, 1984

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



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Geological Discussion

Trave E-87 is located on the western side of the Outer Ridge Complex. The fault bounded structure tested gas and condensate from Lower Cretaceous sandstone reservoirs. Resource estimates are below that required for commercial development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2232-2237.5 (Lower Cretaceous)	48/64	500*	15.7	0
		60/64	550*	17.5	0
2	2144-2150 (Lower Cretaceous)	56/64	96*	6.8	34

* Condensate



Department of Energy

Government of Newfoundland and Labrador

Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: SOUTH TEMPEST

DISCOVERY WELL: Mobil et al South Tempest G-88

LOCATION: $47^{\circ} 07' 20''$ N; $47^{\circ} 57' 30''$ W

STATUS: Abandoned Oil Well

FINAL TOTAL DEPTH: 4675m

WATER DEPTH: 158m

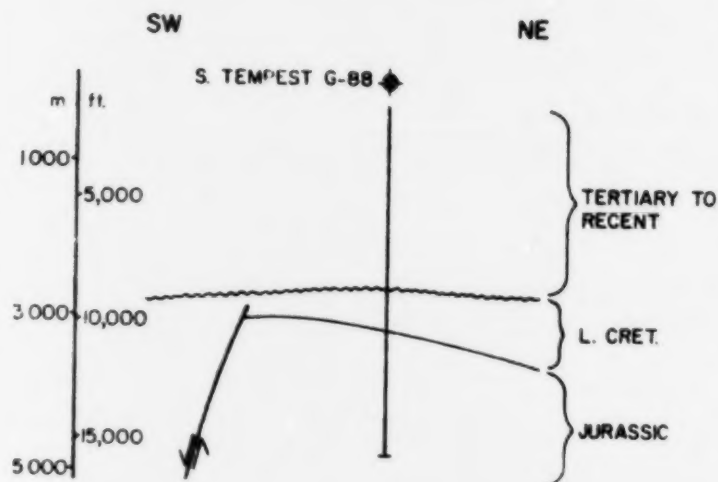
DRILLING UNIT: Zapata Uglund

SPUD DATE: September 16, 1980

RIG RELEASE DATE: April 28, 1981

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Department of Energy

Government of Newfoundland and Labrador

Geological Discussion

The South Tempest structure is a tilted fault block on the west side of the Outer Ridge Complex. Reservoir quality sandstones were encountered in the Upper Jurassic but were not fully evaluated due to mechanical problems during testing. The resource potential for this structure is far below that required for commercial development, however, there are still several fault blocks in this region that need to be evaluated.

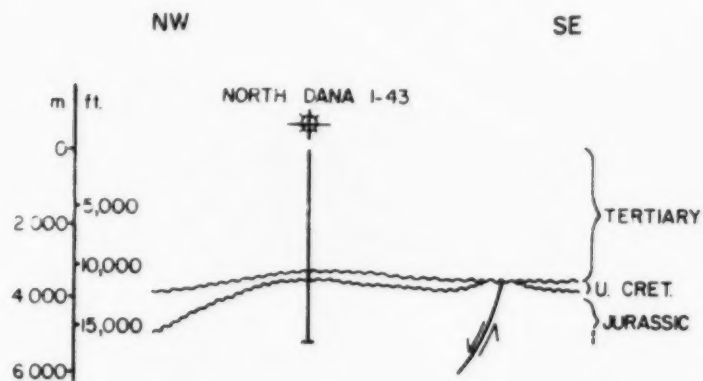
DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	4109-4117 (Jurassic)	16/64	1250	5.0	0
2	4041-4049 (Jurassic)	26/64	Misrun		
3	4041-4049 (Jurassic)	6/64	192	0.3	0
4	3850-3855 (Jurassic)	16/64	No rates due to testing problem		
5	3826-3834 (Jurassic)	32/64	145	Trace	0
6	3568-3582 (Jurassic)	32/64	Misrun		
7	3568-3582 (Jurassic)	32/64	0	0	53



Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME:	NORTH DANA
DISCOVERY WELL:	Mobil et al North Dana I-43
LOCATION:	47 ° 12' 44" N; 47° 36' 13" W
STATUS:	Abandoned Gas Well
FINAL TOTAL DEPTH:	5304m
WATER DEPTH:	221m
DRILLING UNIT:	Sedco 706
SPUD DATE:	December 13, 1982
RIG RELEASE DATE:	January 17, 1984
STEPOUT WELLS:	None

SCHEMATIC CROSS-SECTION



Geological Discussion

North Dana is located on the eastern margin of the Outer Ridge Complex which is a north-south trending province of uplifted Jurassic fault blocks between the Avalon Basin to the west and the Flemish Basin to the east. Reservoirs in a tilted Jurassic block tested gas at North Dana, however, resource estimates indicate the structure could not be developed commercially under present conditions.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	4536.5-4548.0 (Jurassic)	Misrun			
2	4536.5-4548.0 (Jurassic)	64/64	285*	12.5	0
3	4439.0-4457.0 (Jurassic)	Misrun			
4	4439.0-4457.0 (Jurassic)	Misrun			

* Condensate



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Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: NORTH LEIF

DISCOVERY WELL: Petro Canada et al North Leif I-05

LOCATION: $54^{\circ} 24' 39''$ N; $55^{\circ} 15' 11''$ W

STATUS: Abandoned

FINAL TOTAL DEPTH: 3513m

WATER DEPTH: 146m

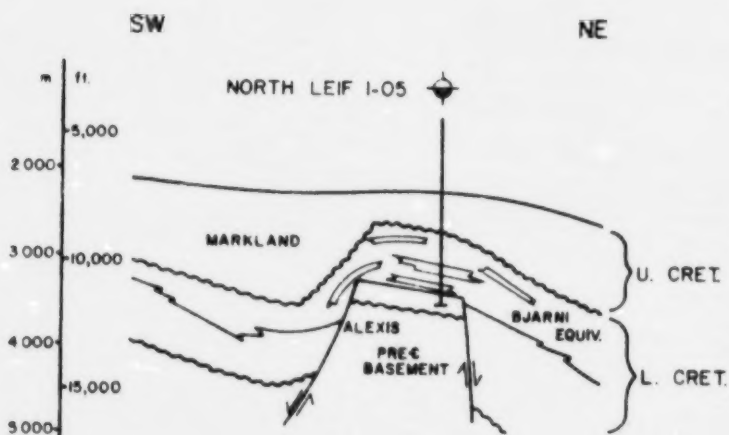
DRILLING UNIT: Pelican/Ben Ocean Lancer/Pacnorse 1

SPUD DATE: September 14, 1980

RIG RELEASE DATE: October 6, 1981

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Department of Energy

Government of Newfoundland and Labrador

Geological Discussion

North Leif I-05 is the first and only well to date to have encountered oil on the Labrador Margin. The reservoir is a Lower Cretaceous Bjarni sandstone which onlaps a Precambrian basement fault block. The waxy nature and high pour point of the crude oil tested indicated that the source rock from which the hydrocarbon was generated is rich in terrestrial organic material. This discovery has no potential for commercial production.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1 to 4	Misruns				
5	3101.8-3109.8 (Bjarni Formation)	Misrun	22 bbl of oil were recovered from the drill pipe.		



Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: GUDRID

DISCOVERY WELL: Eastcan et al Gudrid H-55

LOCATION: $54^{\circ} 54' 30''$ N; $55^{\circ} 52' 32''$ W

STATUS: Abandoned Gas Well

FINAL TOTAL DEPTH: 2838m

WATER DEPTH: 299m

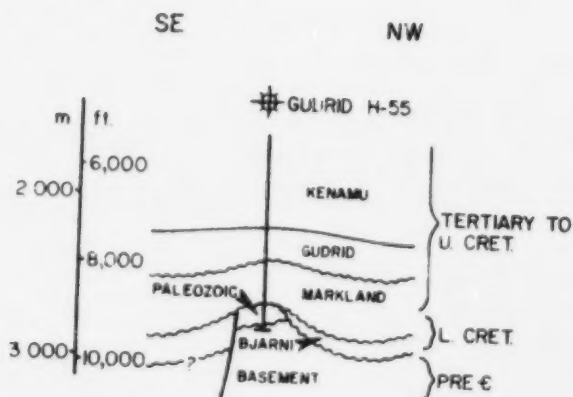
DRILLING UNIT: Pelican

SPUD DATE: July 12, 1974

RIG RELEASE DATE: October 3, 1974

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Geological Discussion

Gudrid H-55, was drilled on an uplifted Precambrian fault block and penetrated an erosional remnant of hydrocarbon-bearing Paleozoic dolomite immediately overlying basement. This fractured dolomite tested gas and condensate from two separate intervals. Resource estimates are below that required for commercial development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2756.3-2771.9 (Paleozoic Dolomite)	48/64	55*	8.1	0
2	2663.3-2723.1 (Paleozoic Dolomite)	40/64	112*	20.0	0

* Condensate



Department of Energy

Government of Newfoundland and Labrador

Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: BJARNI

DISCOVERY WELL: Eastcan et al Bjarni H-81

LOCATION: $55^{\circ} 30' 30''$ N; $57^{\circ} 42' 06''$ W

STATUS: Abandoned Gas Well

FINAL TOTAL DEPTH: 2515m

WATER DEPTH: 140m

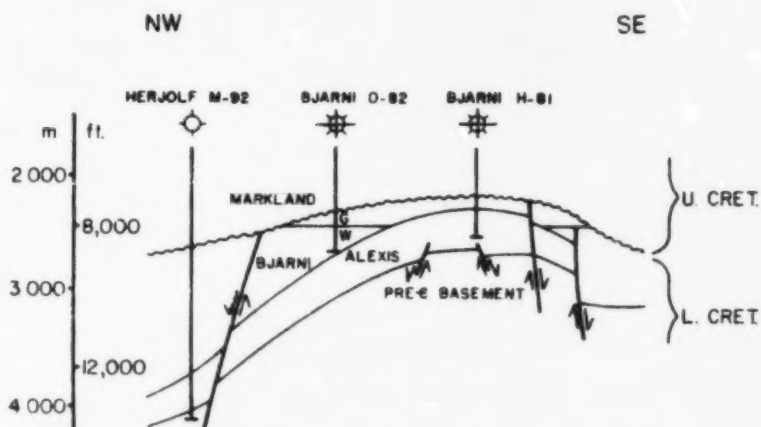
DRILLING UNIT: Pelican

SPUD DATE: August 29, 1973

RIG RELEASE DATE: October 14, 1974

STEPOUT WELLS: Eastcan et al Bjarni O-82

SCHEMATIC CROSS-SECTION



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Government of Newfoundland and Labrador

Geological Discussion

The Bjarni structure was the site of the first significant gas discovery on the Labrador Margin. Hydrocarbon-bearing sandstones were encountered in the Early Cretaceous Bjarni Formation which are draped over a faulted basement high. The Herjolf M-92 well drilled in 1976, encountered over 915m of Bjarni sandstone (equivalent) but unfortunately the reservoirs were water-bearing. Bjarni O-82, drilled in 1979-80, defined the G/W interface for the Bjarni closure. Resource estimates are below that required for development but its proximity to North Bjarni may allow for some form of joint development in the future.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2150.7-2255.5 (Bjarni)	1 16/64"	100*	12.9	0

* Condensate



Department of Energy

Government of Newfoundland and Labrador

Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: NORTH BJARNI

DISCOVERY WELL: Petro Canada et al North Bjarni F-06

LOCATION: $55^{\circ} 35' 30''$ N; $57^{\circ} 45' 50''$ W

STATUS: Abandoned Gas Well

FINAL TOTAL DEPTH: 2812m

WATER DEPTH: 150m

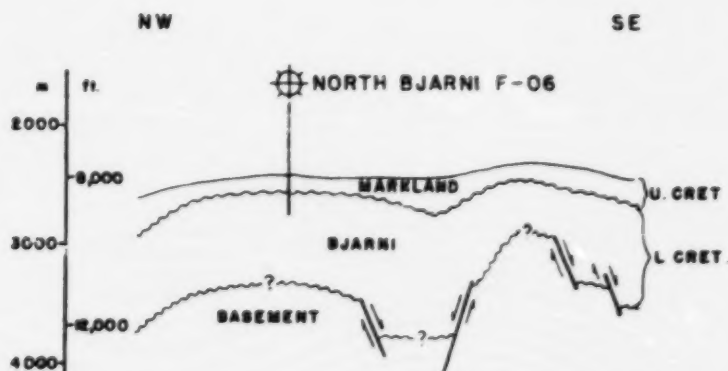
DRILLING UNIT: Pelican/Ben Ocean Lancer/Pacnorse 1

SPUD DATE: September 28, 1980

RIG RELEASE DATE: September 17, 1983

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Department of Energy
Government of Newfoundland and Labrador

Geological Discussion

North Bjarni is a separate geological structure north of the Bjarni discovery. Reservoir sandstones of the Lower Cretaceous Bjarni Formation are draped over a faulted basement high. The structure has 177m of net pay which is one of the thickest pay sections of any well drilled in Canada. The structure appears to be filled to the spillpoint and a gas resource of 2 TSCF is estimated. This structure together with Bjarni and other undrilled structures may contain enough reserves for commercial development in this area.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
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No rates due to mechanical problems.



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Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: HOPEDALE

DISCOVERY WELL: Chevron et al Hopedale E-33

LOCATION: $55^{\circ} 52' 24''$ N; $58^{\circ} 50' 52''$ W

STATUS: Abandoned Gas Well

FINAL TOTAL DEPTH: 2069m

WATER DEPTH: 550m

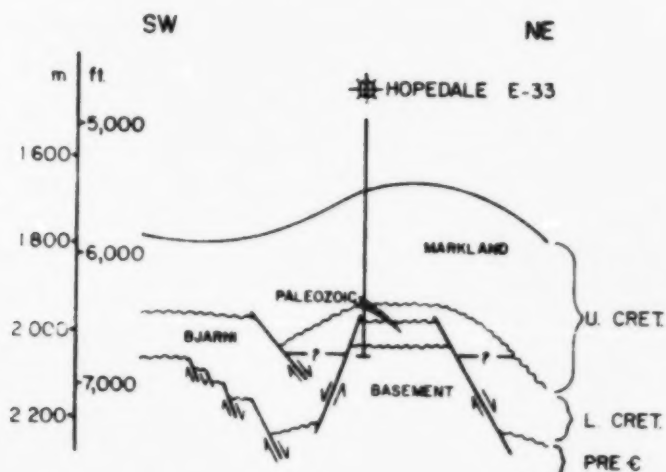
DRILLING UNIT: Ben Ocean Lancer/Petrel

SPUD DATE: August 9, 1978

RIG RELEASE DATE: August 30, 1983

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Geological Discussion

Hopedale E-33 was drilled on a basement high and encountered two gas reservoirs. The upper reservoir consists of porous Lower Cretaceous Bjarni sandstones which drape the structure while the lower is an erosional remnant of an Ordovician carbonate overlying economic basement. Pressure calculations indicate the structure may be filled below the spillpoint and a stratigraphic component to the trap is possible.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	1983-1997 (Paleozoic Carbonate)	N/A*	502**	19.5	0
2	1948-1959 (Bjarni Formation)	N/A	Misrun		
3	1948-1959 (Bjarni Formation)	N/A	310**	14.2	0

* Not Available

** Condensate



Department of Energy

Government of Newfoundland and Labrador

Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: SNORRI

DISCOVERY WELL: Eastcan et al Snorri J-90

LOCATION: $57^{\circ} 19' 45''$ N; $59^{\circ} 57' 45''$ W

STATUS: Suspended Gas Well

FINAL TOTAL DEPTH: 3210m

WATER DEPTH: 141m

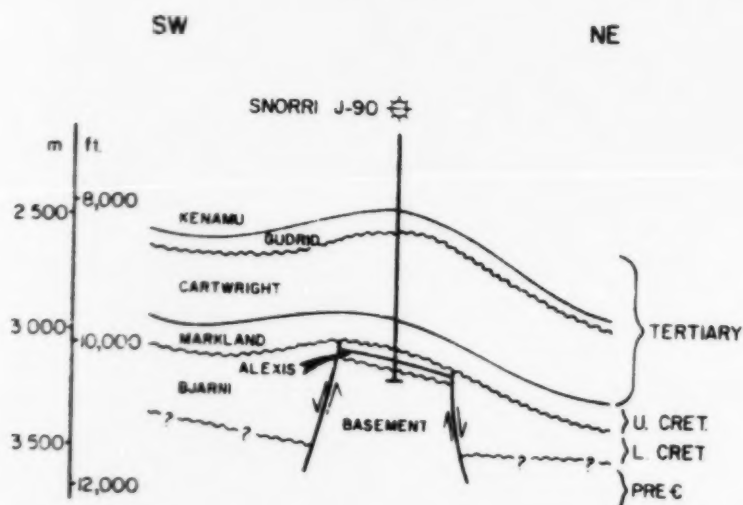
DRILLING UNIT: Sedco 445/Pelican

SPUD DATE: July 28, 1975

RIG RELEASE DATE: September 8, 1976

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Geological Discussion

Snorri J-90 was drilled on an eroded basement fault block and was the first well to encounter significant volumes of hydrocarbons in the Paleocene Gudrid sandstone. The reservoir consists of fine grained, well sorted, calcareous sandstone and is found draped over the underlying fault block. Resource estimates are below that required for commercial development.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	2493.3-2502.4 (Gudrid)	32/64	224*	9.8	0

* Condensate



Department of Energy

Government of Newfoundland and Labrador

Significant Discoveries Offshore Newfoundland and Labrador

STRUCTURE NAME: FORTUNE

DISCOVERY WELL: Husky/Bow Valley et al Fortune G-57

LOCATION: $46^{\circ} 36' 19''$ N; $48^{\circ} 08' 02''$ W

STATUS: Abandoned Oil Well

FINAL TOTAL DEPTH: 4995m

WATER DEPTH: 113m

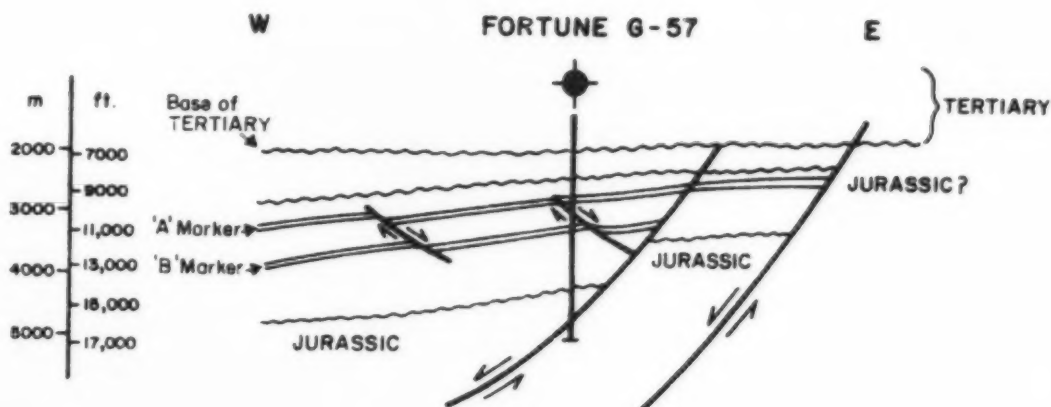
DRILLING UNIT: Bow Drill 3

SPUD DATE: February 5, 1986

RIG RELEASE DATE: September 9, 1986

STEPOUT WELLS: None

SCHEMATIC CROSS-SECTION



Department of Energy

Government of Newfoundland and Labrador

Geological Discussion

The Fortune Structure is located in the hinge zone along the south-eastern margin of the Avalon Basin. The tilted fault bounded structure contained oil-bearing reservoirs of Lower Cretaceous and Jurassic Age. This discovery will require delineation before the resource potential and commercial viability can be ascertained.

DST NO.	INTERVAL (M) (FORMATION)	CHOKE SIZE (inches)	OIL RATE (Bbls/day)	GAS RATE MMCF/day	WATER RATE (Bbls/day)
1	4030.6-4039.7	32/64	679	.538	0
2	3988.9-4002.3		Misrun		
3	3988.9-4002.3	72/64	1,355	2.5	0
4	4400.7-4452.5		Misrun		
5	4400.7-4452.5		Misrun		
6	4400.7-4452.5		Misrun		
7	4400.7-4452.5	48/64	4,944	5.35	0



Department of Energy

Government of Newfoundland and Labrador

APPENDIX

5

DEPARTMENT OF ENERGY
GENERAL STATISTICS ON SIGNIFICANT DISCOVERIES
OFFSHORE NEWFOUNDLAND AND LABRADOR

WELL NAME	OPERATOR	LATITUDE	LONGITUDE	DRILLING UNIT	SPUD DATE	TOTAL DEPTH (M)	STATUS
Adolphus 2K-41	Mobil	470040.56	482206.47	Sedco J	721217	3657.6	Abandoned - Oil Shows
Adolphus K-41	Mobil	470039.22	482204.29	Sedco J	721116	1239.0	Abandoned
Sen Nevis I-45	Mobil	463439.74	482109.84	Zapata Uglund	800110	4932.6	Abandoned Oil Well
Beothuck M-05	Canterra	462448.55	483114.05	Vinland	841105	3779.0	Abandoned Oil Well
Bjarni H-81	Eastcan	553029.35	574205.52	Pelican	730829	2514.6	Abandoned Gas Well
Bjarni O-82	Eastcan	553148.22	574234.70	Petrel	790730	2650.0	Abandoned Gas Well
Fortune G-57	Husky Bow Valley	463618.90	480802.21	Bow Drill 3	860205	4995.1	Abandoned Oil Well
Gudrid H-55	Eastcan	545430.02	555232.22	Pelican	740714	2838.0	Abandoned Gas Well
Hebron I-13	Mobil	463233.95	483145.47	Sedco 706/ John Shaw	810114	4723.5	Abandoned Oil Well
Hibernia B-08	Mobil	464706.36	484529.87	Sedco 706	800319	4535.5	Abandoned Oil/Gas Well
Hibernia B-27	Mobil	464611.21	484828.34	Zapata Uglund	830808	4380.0	Abandoned Oil Well
Hibernia C-96	Mobil	464510.19	484435.77	West Venture	840121	4420.2	Abandoned Oil Well
Hibernia I-46	Mobil	464540.74	485117.20	West Venture	821218	3435.7	Abandoned Oil Well
Hibernia J-34	Mobil	464333.84	485013.00	Ocean Ranger/ Weddrill 2	811129	3711.8	Abandoned Oil Well



1988/03/25

DEPARTMENT OF ENERGY
GENERAL STATISTICS ON SIGNIFICANT DISCOVERIES
OFFSHORE NEWFOUNDLAND AND LABRADOR

WELL NAME	OPERATOR	LATITUDE	LONGITUDE	DRILLING UNIT	SPUD DATE	TOTAL DEPTH (M)	STATUS
Hibernia K-14	Mobil	464339.83	484736.18	West Venture	830809	4462.0	Abandoned Oil Well
Hibernia K-18	Mobil	464734.69	484717.05	Ocean Ranger/ Zabata Uglan	810226	5039.3	Abandoned Oil Well
Hibernia O-35	Mobil	464454.92	484953.74	Sedco 709	800101	4788.5	Abandoned Oil Well
Hibernia P-15	Chevron	464458.98	484651.18	Glomar Atl./ Zapata Uglan	790527	4406.8	Abandoned Oil Well
Hopedale E-33	Chevron	555224.34	585052.45	Ben Ocean Lancer	780809	2069.4	Abandoned Gas Well
Mara M-54	Mobil	464347.95	483844.60	John Shaw	841021	4446.2	Abandoned Oil Well
Nautilus C-92	Mobil	465103.55	484420.64	Sedco 706	810929	5116.7	Abandoned Oil Well
North Ben Nevis P-93	Husky Bow Valley	464248.10	482834.24	Bow Drill 3	841218	5282.2	Abandoned Oil/Gas Well
North Bjarni F-06	Petro-Canada	553529.34	574549.40	Pelican/B.O.L.	800928	2812.0	Abandoned Gas Well
North Dana I-43	Mobil	471243.60	473612.62	Sedco 706	821213	5303.6	Abandoned Gas Well
North Leif I-05	Petro-Canada	542438.95	551510.57	Pelican/Pelerin	800914	3513.0	Abandoned Oil Shows
Snorri J-90	Eastcan	571944.52	595744.37	Sedco 445/Pelican	750728	3209.9	Suspended Gas Well
South Mara C-13	Mobil	464201.07	483219.63	John Shaw	840321	5034.1	Abandoned Oil/Gas Well
South Tempest G-88	Mobil	470719.92	475730.48	Zapata Uglan	800916	4674.8	Abandoned Oil/Gas Well

DEPARTMENT OF ENERGY
GENERAL STATISTICS ON SIGNIFICANT DISCOVERIES
OFFSHORE NEWFOUNDLAND AND LABRADOR

WELL NAME	OPERATOR	LATITUDE	LONGITUDE	DRILLING UNIT	SPUD DATE	TOTAL DEPTH (M)	STATUS
Terra Nova K-08	Petro-Canada	462731.60	483059.60	Sedco 710	830802	4499.8	Abandoned Oil Well
Terra Nova K-18	Petro-Canada	462744.05	483231.58	Sedco 710	840719	3925.6	Abandoned Oil Show
Terra Nova K-17	Canterra PCI	462643.51	483231.67	Sedco 710	850925	3250.0	Abandoned Oil Show
Terra Nova K-07	Petro-Canada	462643.57	483057.76	Vinland	850905	3550.0	Suspended Oil Well
Terra Nova I-97	Petro-Canada	462642.68	482849.44	Vinland	851126	3465.0	Suspended Oil Well
Terra Nova H-99	Petro-Canada	462829.38	482850.01	Sedco 710	870613	3510.0	Suspended Oil Well
Terra Nova C-09	Petro-Canada	462809.58	483058.80	Sedco 710	871213	3640.0	Suspended Oil Well
Terra Nova E-79	Petro-Canada	462829	482643	Sedco 710	880305	--	Drilling
Trave E-87	Husky Bow Valley	465617.56	475809.74	John Shaw/ Sedco 706	831112	3985.6	Abandoned Gas Well
West Ben Nevis B-75	Petro-Canada	463401.24	482603.50	Bow Drill 1/ Sedco 710	840715	4987.0	Abandoned Oil Well
Whiterose J-49	Husky Bow Valley	464831.30	480627.51	Bow Drill 2	850727	4561.4	Abandoned Oil/Gas Well
Whiterose L-61	Husky Bow Valley	465034.12	481028.34	Bow Drill 2	851218	3340.3	Abandoned Gas Well
Whiterose N-22	Husky Bow Valley	465147.99	480356.51	Sedco 706	840627	4627.8	Abandoned Oil/Gas Well
Whiterose E-09	Husky Bow Valley	464826.24	480122.65	Bow Drill 3	870820	3810.9	Suspended